

What is claimed is:

- 1 1. A semiconductor cooling device comprising:
  - 2 a cold plate for cooling a semiconductor element;
  - 3 a condenser;
  - 4 an inverter-controlled refrigerant pump, said cold plate, condenser and
  - 5 refrigerant pump being fluid connected in series with each other to define a
  - 6 refrigerating cycle;
  - 7 a fan for cooling said condenser;
  - 8 a temperature detector disposed in proximity to said semiconductor
  - 9 element; and
  - 10 a controller for controlling said refrigerant pump and said fan;
  - 11 wherein said controller controls the number of revolutions of said
  - 12 refrigerant pump and that of said fan depending on a value measured by said
  - 13 temperature detector.
- 1 2. The semiconductor cooling device according to claim 1, wherein the
- 2 temperature detector is accommodated in said semiconductor element.
- 1 3. The semiconductor cooling device according to claim 1, wherein when
- 2 the amount of heat emitted from said semiconductor element is less than a
- 3 predetermined level, said controller reduces the number of revolutions of said fan
- 4 before that of said refrigerant pump.
- 1 4. The semiconductor cooling device according to claim 1, wherein when
- 2 the value measured by said temperature detector increases more than a
- 3 predetermined value within a predetermined period of time, said controller maximizes
- 4 the number of revolutions of said fan and thereafter increases the number of
- 5 revolutions of said refrigerant pump step by step while comparing the value
- 6 measured by said temperature detector with a value set in said controller, and
- 7 wherein when the number of revolutions of said refrigerant pump has reached a
- 8 maximum value, if the value measured by said temperature detector does not

9     become less than the set value, said controller outputs an alarm signal.

1     5.             The semiconductor cooling device according to claim 1, wherein said  
2     controller watches a signal indicative of a current value of said refrigerant pump, and  
3     if such current value becomes greater than a value set in said controller, said  
4     controller outputs an alarm signal.

1     6.             The semiconductor cooling device according to claim 1, wherein said  
2     controller watches an operating time of said refrigerant pump, and if a total operating  
3     time of said refrigerant pump has reached a service life set in said controller, said  
4     controller outputs an alarm signal.